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March 11, 1997

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, NW Room 222
Washington, D.C. 20554

EX PARTE: Federal-State Joint Board on Universal Service (CC Docket No. 96-45)

Dear Mr. Caton:

Today representatives of GTE Service Corp. and Dr. Greg Duncan of National Economic Research Associates met with FCC staff members C. Anthony Bush, Emily Hoffnar, and Bill Sharkey and via conference call with Charles Bolle of the South Dakota Public Utility Commission and Barry Payne of the Indiana Consumer Council to discuss GTE's position on cost proxy models in the captioned docket. GTE used the attached presentation by Dr. Duncan in the presentation. In accordance with Section 1.1206(a)(1) of the Commission's Rules, an original and two copies of this notice are being filed with the Secretary of the FCC.

Please let me know if you have any questions.

Sincerely,

Charon J. Harris

Attachment
cc: C.A. Bush
E. Hoffnar
W. Sharkey
C. Bolle
B. Payne

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List ABCDE

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HATFIELD MODEL

RELEASE 3.1

PRELIMINARY MODEL ANALYSIS

BY

GREGORY M. DUNCAN

PREPARED FOR

GTE

MARCH 11, 1997

I. EXECUTIVE SUMMARY:

We conducted a preliminary analysis on the very latest of a series of Hatfield Model Releases, namely Hatfield Model Release 3.1. Release 3.1 was filed with the Federal-State Joint Board on February 28, 1997, only three weeks after the launch of Hatfield Model, Release 3.0.

The main focus of this analysis was to determine whether any of the necessary improvements and corrections have been undertaken by the developers of the model that would render the model a useful tool to estimate TELRICs. As will be shown in the following sections, many changes have occurred in this latest release, however only in a few isolated instances actual improvements have been made. In some instances the misspecifications of the model have been worsened by the changes. By and large, the fundamental structure of the model has not changed. Hence, unless pointed out otherwise, our criticisms of the Hatfield Model as thoroughly described in the NERA paper entitled "Economic Evaluation of the Hatfield Model" by Gregory Duncan and Timothy Tardiff, dated February 16, 1997, still apply.

Rather than reiterating the points that we have already made in the paper cited above, this paper discusses only the *latest* changes to the model.

The paper is divided into six sections. First, we discuss any cosmetic and programming changes that have occurred in this latest release. Second, our analysis will focus on changes in the national default values of the user-adjustable input variables. Third will be an analysis of the different demographic inputs, i.e., the number of wirecenters, the number of lines and the number of households and how they have changed. Fourth, Release 3.1 will undergo the same internal validity checks as already performed on all previous versions and releases. Fifth, we compared the estimates for total network investment to Release 3.0 and the TELRICs for all of the proposed unbundled network elements to actual GTE figures. We conclude this paper with a brief summary and some useful insights of what can be learned from the different releases.

II. COSMETIC AND PROGRAMMING CHANGES TO THE HATFIELD MODEL

The Hatfield Model Release 3.1 has undergone some programming and cosmetic changes. The most important of these changes are listed below:

- While Release 3.0 has only run a few selected states and companies, the new release runs on 49 states for all RBOCs as well as Non-RBOCs.
- The model seems to execute slightly faster than Release 3.0. Average running time on a 133 MHz Pentium PC is approximately fifteen (15) minutes.
- The programming code seems to have been "debugged" as the model now also runs on Pacific Bell -- a task that was not manageable in Release 3.0.
- Release 3.1 can now display its TELRIC estimates not only by density zone and wirecenter but also by CBG.
- The model's documentation is largely the same, but does, however, very interestingly not cover *any* of the many changes that have occurred since release 3.0. In addition, when installing Release 3.1 any previous versions (namely Release 3.0) of the model will be deleted.
- For GTE Corporation, specifically, the model now names GTE in conjunction with Contel, i.e., "GTE of California, Inc." is now "GTE/Contel California, Inc.". Previous versions of the model have not done so, even though they have accounted for Contel territory in most states.
- The labeling errors of ARMIS expense accounts have been corrected. While Release 3.0 still labeled expense accounts the same as investment accounts, this problem has been remedied. For example, 21XX accounts are investment accounts. Their corresponding expense accounts are 61XX accounts.

III. National Default changes between Releases

A comparison of the national default input values of the Hatfield Model Release 3.0 and 3.1 revealed the following changes. Note that these changes occurred within two (2) weeks after the release of 3.0.

A. Distribution Inputs

1. Drop Variables:

- The default values for the "buried drop fraction" have changed in the following fashion:

Density Zone	Release 3.0 Default Values	Release 3.1 Default Values
0	50	75
5	50	75
100	50	75
200	50	70
650	50	70
850	70	70
2550	70	70
5000	40	40
10000	10	15

2. Cable and Riser Investment

- In Release 3.1, two distribution cable sizes were added to the existing ten (10) sizes, namely a twelve (12) and a six (6) pair cable. The default cable cost per foot for these new cable sizes is $ 0.76 (for 12) and $ 0.63 (for 6).

3. Geology and Cluster

- Release 3.1 includes a new variable called "sidewalk/street fraction" with a default of 0.20.

  Definition: The fraction of small (< .03 sq. mile) downtown CBGs that are streets and sidewalks[1].
- The "Local RT (per cluster) threshold" variable changed the maximum total distance from 12, 000 ft (R. 3.0) to 18,000 ft (R. 3.1).
- The "lines per cluster" variable got deleted.
- The "Number of Cluster (2 or 4) – sparse CBGs" got deleted.
- The "Sparse CBG threshold" got deleted.

4. SAI Investment

- A new category "SAI Investment" has been added to the distribution inputs of Release 3.1. This category includes cost figures for indoor and outdoor SAIs in all nine (9) density zones.

B. FEEDER INPUTS

1. Fiber Placement

- The fiber placement fraction in the 200-649 lines per square mile density zone has been changed. The aerial fraction in Release 3.0 was 10% while the underground fraction was at 30%. Release 3.1's default values for these two variables are 20% and 20%, respectively.

[1] Appendix B - Hatfield Model Release 3.1 Inputs, Assumptions and Default Values, Hatfield Associates, Boulder, Colorado, page 17.

2. Copper Manhole Investment

- The "excavate and backfill" costs have been changed in the following fashion:

Density Zone	Release 3.0 Default Values	Release 3.1 Default Values
0	$ 2340	$ 2800
5	$ 2340	$ 2800
100	$ 2340	$ 2800
200	$ 2340	$ 2800
650	$ 2340	$ 3200
850	$ 2340	$ 3500
2550	$ 2340	$ 3500
5000	$ 2340	$ 5000
10000	$ 2340	$ 5000

C. SWITCHING INPUTS

- Note: This input category was titled "Wirecenter Inputs" in Release 3.0.

1. End Office Switching

- The default value for the "Analog Line Circuit Offset of DLC per line" variable has changed from $ 35.00 to $ 5.00.
- Two new variables titled "EO Switching Investment term, small ICO with default value of $ 416.11 and "EO Switching Investment term, BOC and large ICO" with default of $242.73 have been added.

  Definition: The value of the constant appearing in the function that calculates the

per line switching investment as a function of switch line size, expressed separately for BOCs and large independents and for small independents[2].

2. Traffic Parameters

- The default value for "ICO STP investment per line" has changed from $5.38 to $5.50.
- The default value for "ICO Local Tandem Investment per line" has changed from $ 0.81 to $ 1.90.
- The default value for "ICO Tandem Investment per line: has changed from $ 0.36 to $ 0.80.

3. Interoffice Investment

- The default value for "OC-48 ADM installed, 12 DS-3s" has changed from $ 37,000 to $ 40,000.
- The default value for "Fraction of SA Lines req., multiplex" has changed from 10% to 50%.
- The variable "DCS installed per DS-3 with a default of $30,000 has been added.
- The variable "DSX Panel Installed per STS 3" has been deleted.
- The variable "Transmission Terminal Fill" with a default of 0.90 has been added.
- The variable "underground fraction" has been changed to "aerial fraction."

4. Transmission Parameters

- The variable "POPs per tandem location" with default value at 5 has been added.

5. Tandem Switching

- The variable "Entrance Facility Distance, miles, with default value at 0.5 has been added.

[2] Appendix B. – Hatfield Model Release 3.1 Inputs, Assumptions and Default Values, Hatfield Associates, Boulder, Colorado, page 32.

6. ICO Parameters

- This category has been added to the "Switching Inputs" group. It includes the following new variables:

  - STP investment per line/ SCP-STP Wirecenter
  - Local Tandem Investment per Line
  - OS tandem Investment per Line
  - SCP Investment per Line /Tandem A links and C links per line.

D. EXPENSE INPUTS

1. Depreciation

- The variable "NID/SAI, account 2362" has been deleted.

2. Others

- The default value for "tax rate" has been changed from 40% to 39.25%.
- The variable "state & local income tax factor" has been deleted.
- The variable "service order processing fraction 6623" has been deleted.
- The variable "EO Traffic Sensitive Fraction" has been deleted.

E. MODULE CHANGES

- The Hatfield Model Release 3.1 has added an "Expense by CBG module" to display the results not only by density zone and wirecenter but also by CBG.

F. CHANGES TO ARMIS

- The composition of the "network support" factor has changed. In Release 3.0 it consisted of accounts 6112, 6113, 6114, 6115 and 6116. In Release 3.1, it only consists of accounts 6113 and 6114. This factor is being used to estimate network support expenses.
- Public Telephone has been deleted from the "95 Actual" sheet.

To test the net effects of these default changes, we performed a run on Release 3.1 for GTE/Contel of California, Inc., using Release 3.0 national default values. For this run, "Total Loop (all)" was estimated at $ 12.26 while "Total Cost of Switched Network Elements" was at $17.19. The corresponding numbers for the default run in Release 3.0 are $12.64 and $16.59. Hence, the new national default values lower the two key estimates by $0.38 and $0.60, respectively. All of the estimates above are on a per line, per month basis. These results, as well as the results, for the 3.1 default base case are given below.

GTE California			
Model	**Model Default**	**Loop Cost**	**Total Cost**
3.0	**3.0 Assumptions**	$12.64	$16.59
3.1	**3.0 Assumptions**	$12.26	$17.19
3.1	**3.1 Assumptions**	$12.08	$17.40

IV. DEMOGRAPHIC INPUT CHANGES

A crucial mistake that we have pointed out on many occasions is the fact the Hatfield Model does not accurately represent the ILECs current serving area. A first check of the new release shows that this problem has *not* been taken care of. For GTE/Contel Texas the number of wire centers in release 2.2 was 491, in release 3.0 it was 462 and finally in release 3.1 it is at

460. While the developers of the Hatfield Model have correctly identified an area that is in desperate need of improvement, it still has not gotten the facts right. The actual number of wirecenters for GTE/Contel Texas is 545. Hence the Hatfield Model Release 3.1 builds a network for GTE/Contel Texas based on 460 instead of 545 wirecenters—an understatement of 15.6%. For GTE/Contel California, the current release misses 12 out of 278 wirecenters and includes 2 extraneous ones – a misspecification of 5.4%.

One of the major changes that has occurred between release 2.2 and release 3.0 was the use of a new database. The new database was obtained from PNR Associates of Jenkinstown, Pennsylvania. Among others, its purpose was to estimate the number of lines per CBG. While one might expect this database to be rather stable, Release 3.1 shows enormous changes in the line count per wirecenter. On a per wirecenter level, changes have been made anywhere between -71.74% and +774.45%! Following tables illustrate this point for GTE/Contel Texas and GTE/Contel California.

Table 1

Total Line Count
Hatfield Model Release 3.0 and Hatfield Model Release 3.1
GTE/Contel Texas, Inc.

	HM 3.0 (Base)	HM 3.1	Total Percentage Change	Minimum % Change (per WC)	Maximum % Change (per WC)
	(1)	(2)	(3) (2)/(1)-1	(4)	(5)
Total Lines	1,823,919	1,783,280	-2.23%	-11.93%	213.50%
Business Lines	463,684	459,985	-0.80%	-3.17%	467.80%
Residential Lines	1,193,442	1,170,347	-1.94%	-2.18%	177.68%
Special Access Lines	157,661	144,673	-8.24%	-40.92%	436.98%
Public Lines	9,132	8,275	-9.38%	-50.83%	436.98%
Households	1,153,993	1,167,313	1.15%	0.00%	254.68%

Table 2

Total Line Count
Hatfield Model Release 3.0 and Hatfield Model Release 3.1
GTE/Contel of California, Inc.

	HM 3.0 (Base) (1)	HM 3.1 (2)	Total Percentage Change (3) (2)/(1)-1	Minimum % Change (per WC) (4)	Maximum % Change (per WC) (5)
Total Lines	4,311,673	4,176,095	-3.14%	-17.15%	223.20%
Business lines	1,227,835	1,191,693	-2.94%	-4.40%	774.45%
Residential lines	2,824,669	2,762,493	-2.20%	-2.06%	15.77%
Special access lines	215,386	179,223	-16.79%	-71.74%	759.65%
Public Lines	43,783	42,686	-2.51%	-5.20%	759.65%
Households	3,657,688	3,653,008	-0.13%	0.00%	246.95%

Interestingly, as can be seen in the tables above, the number of households has changed too, even though the source and method for this data have not changed since the model's very first release in May of 1996. While one might only guess why these factual numbers seem to change within weeks, it strengthens a point that we have made earlier: the Hatfield model is fundamentally flawed, highly unstable and can not be relied on.

V. INTERNAL VALIDITY CHECKS

A very basic and essential check that every cost model should fulfill is the internal validity check, i.e. linear homogeneity. We have performed this test on the latest release of the Model. The results of the test confirmed one of our main points that we have emphasized on many occasions: The Hatfield model, regardless of Version or Release, is *not* a valid economic cost model because it fails the internal validity check required of any cost model.

Below are the results of this check for GTE/Contel California as well as for GTE/Contel Texas.

Table 3

Comparison of Hatfield Model Release 3.1 TSLRIC Results
GTE/Contel Texas, Inc.

	GTE Base Case	Costs with All Input Prices Increased 10%	Percent Change	Percent of Total Cost of Network Elements (Base)
	(1)	(2)	(3) [(2)-(1)]/(1)	(4)
NID	$ 0.50	$ 0.55	9.22%	1.91%
Loop Distribution	$ 9.43	$ 10.32	9.44%	35.70%
Loop Concentration	$ 3.51	$ 3.79	8.07%	13.29%
Loop Feeder	$ 4.11	$ 4.50	9.52%	15.54%
Total Loop	$ 17.55	$ 19.16	9.18%	66.43%
Total Cost of Network Elements	$592,594,582.74	$645,960,069.93	9.01%	100.00%

Table 4

Comparison of Hatfield Model Release 3.1 TSLRIC Results
GTE/Contel of California, Inc.

	GTE Base Case	Costs with All Input Prices Increased 10%	Percent Change	Percent of Total Cost of Network Elements (Base)
	(1)	(2)	(3) [(2)-(1)]/(1)	(4)
NID	$ 0.64	$ 0.70	9.34%	3.69%
Loop Distribution	$ 6.23	$ 6.82	9.44%	35.82%
Loop Concentration	$ 2.56	$ 2.81	9.41%	14.74%

Loop Feeder	$ 2.64	$ 2.89	9.45%	15.17%
Total Loop	$ 12.08	$ 13.22	9.43%	69.43%
Total Cost of Network Elements	$902,184,448.39	$972,283,610.68	7.77%	100.00%

The increase for GTE/Contel Texas was 9.01%. For GTE/Contel California the same test resulted in an increase of 7.77%. Linear homogeneity requires "Total Cost of Network Elements" to increase by *exactly* 10.00%. Hence, Release 3.1 still does not fulfill this very important test and can therefore not be a valid cost model.

VI. Network Investment and TELRIC Estimates by Releases

In a next step of our analysis, we analyzed the consequences of these radical changes. First, we performed a validation analysis analogous to those we have already performed for previous releases and versions. In those, we compared the amount of dollar investments and expenses predicted by the Hatfield Model Release 3.1 to those reported in ARMIS in various reports (mainly 43-03). Again, we have conducted this analysis for GTE/Contel Texas and GTE/Contel California. The results are presented in tables 5 and 6 below.

Table 5

Actual versus Hatfield Release 3.1 Comparison
GTE/ Contel Texas
($ mio)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	3,399	2,332	68.60%
General Support Investment	562	134	23.92%
Total Investment	3,976	2,466	62.03%
Network Expenses	119	63	52.86%
Support Expenses	171	72	41.97%
Corporate Expenses	159	55	34.68%
Total Expenses	450	190	42.28%

Table 6

Actual versus Hatfield Release 3.1 Comparison
GTE/ Contel California
($ mio)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	7,700	3,251	42.22%
General Support Investment	1,158	171	14.80%
Total Investment	8,921	3,423	38.36%
Network Expenses	272	107	39.19%
Support Expenses	404	140	34.75%
Corporate Expenses	397	84	21.10%
Total Expenses	1,073	331	30.83%

To illustrate the changes between Release 3.0 and Release 3.1, below are the corresponding tables for Release 3.0.

Table 7

Actual versus Hatfield Release 3.0 Comparison
GTE Southwest, Inc. - Texas
($ mio)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	3,399	2,220	65.32%
General Support Investment	562	132	23.42%
Total Investment	3,976	2,352	59.15%
Network Expenses	119	59	49.06%
Support Expenses	171	72	42.20%
Corporate Expenses	159	53	33.57%
Total Expenses	450	184	40.97%

Table 8

Actual versus Hatfield Release 3.0 Comparison
GTE Of California, Inc.
($ mio)

Cost Category	Actual	Model	Model/Actual
(1)	(2)	(3)	(4) (3)/(2)
Network Investment	7,700	3,254	42.27%
General Support Investment	1,158	177	15.29%
Total Investment	8,921	3,431	38.46%
Network Expenses	272	105	38.42%
Support Expenses	404	144	35.67%
Corporate Expenses	397	85	21.46%
Total Expenses	1,073	334	31.11%

Given all the changes in demographic inputs, in default values and in the addition deletion of input variables, the results of the analysis above are astonishing and unexpectedly similar.

Second, we compared total network investment estimates as produced by Release 3.0 to estimates from Release 3.1. These figures are Hatfield's estimated investments that are necessary to build a telephone network on a "forward-looking basis," serving the ILEC's current level of demand and maintaining current or better service quality. We have compared these investments for two ILECS, namely GTE/Contel Texas and GTE/Contel California. Below, in table 9, are the results for GTE/Contel Texas.

Table 9

Total Network Investment
Hatfield Model Release 3.0 and Hatfield Model Release 3.1
GTE/Contel Texas, Inc.

	HM 3.0 (Base)	HM 3.1	% Change	Min. % Change (per WC)	Max. % Change (per WC)
	(1)	(2)	(3) (2)/(1)-1	(4)	(5)
cpr fdr cbl u/g	$ 46,281,513.33	$ 41,165,879.97	-11.05%	-100.00%	2926.32%
cpr fdr cbl buried	$ 24,902,897.66	$ 21,761,145.41	-12.62%	-100.00%	2926.32%
cpr fdr cbl aerial	$ 26,454,730.61	$ 23,152,765.70	-12.48%	-100.00%	2926.32%
fiber fdr cbl u/g	$ 23,888,224.14	$ 15,981,541.58	-33.10%	-97.57%	3264.45%
fiber fdr cbl buried	$ 173,951,214.29	$ 110,497,421.06	-36.48%	-97.55%	3264.45%
fiber fdr cbl aerial	$ 95,741,123.53	$ 61,358,757.78	-35.91%	-97.57%	3264.45%
total feeder conduit	$ 12,902,784.43	$ 8,791,726.70	-31.86%	-96.40%	3264.45%
total feeder manholes	$ 18,574,279.06	$ 17,821,432.64	-4.05%	-96.40%	3266.69%
cpr fdr u/g placement	$ 41,552,397.58	$ 27,511,304.72	-33.79%	-6102.43%	8105.54%
fiber fdr u/g placement	$ 123,395,322.13	$ 87,512,557.09	-29.08%	-97.30%	3451.61%
cpr fdr buried placement	$ 7,050,667.60	$ 5,712,328.73	-18.98%	-498.14%	7932.81%
fiber fdr buried					

placement	$ 92,077,935.13	$ 59,714,823.19	-35.15%	-97.28%	3269.04%
feeder pole inv	$ 60,803,082.61	$ 42,209,824.05	-30.58%	-94.82%	1771.90%
dist cable underground	$ 2,545,901.15	$ 2,361,806.04	-7.23%	-100.00%	0.41%
dist cable buried	$ 316,905,422.95	$ 407,482,715.92	28.58%	-46.35%	284.51%
dist cable aerial	$ 123,765,327.40	$ 151,208,656.72	22.17%	-50.41%	284.51%
dist conduit	$ 884,306.10	$ 835,691.44	-5.50%	-100.00%	0.00%
dist conduit placement	$ 6,793,343.15	$ 6,226,093.72	-8.35%	-100.00%	0.00%
dist buried placement	$ 301,470,194.54	$ 325,933,019.32	8.11%	-12.00%	215.61%
dist poles	$ 96,955,704.00	$ 105,017,344.00	8.31%	-16.42%	225.68%
calc cpr fdr fill	77.12	70.76	-8.25%	-100.00%	191.95%
calc distribution fill	177.42	186.70	5.23%	-33.17%	301.33%
calc "mainframe fill"	57.61	52.91	-8.16%	-100.00%	182.12%
DLC inv w/site	$ 291,846,510.00	$ 256,023,350.00	-12.27%	-79.98%	212.42%
SAI inv	$ 14,029,261.00	$ 13,807,400.00	-1.58%	-53.27%	210.86%
terminal inv	$ 82,949,882.49	$ 84,474,674.28	1.84%	-5.73%	195.71%
drop inv	$ 41,235,002.11	$ 42,119,500.81	2.15%	-7.46%	164.91%
NID inv	$ 42,724,228.16	$ 42,693,526.96	-0.07%	-9.63%	285.89%
feeder distance	96,029,017	63,929,692	-33.43%	-96.40%	3264.45%
total dist distance	241,022,936	376,989,940	56.41%	0.00%	408.19%
DLC lines	1,156,392	1,163,846	0.64%	-33.32%	302.28%
end office switching	$ 156,644,603.48	$ 195,576,220.40	24.85%	-2.32%	243.68%
MDF/protector inv	$ 11,681,715.42	$ 10,840,095.47	-7.20%	-100.00%	930.81%
end office wire center	$ 49,167,500.02	$ 49,222,499.97	0.11%	-56.82%	206.82%
land	$ 8,330,000.00	$ 8,370,000.00	0.48%	-66.67%	275.00%
total public telephone inv	$ 6,940,310.32	$ 6,288,994.25	-9.38%	-50.83%	436.98%
total residential annual DEMs	20,575,922,096	20,503,613,868	-0.35%	-0.60%	182.17%
total business annual DEMs	12,104,595,904	12,176,904,132	0.60%	-3.30%	476.16%

As table 9 clearly illustrates, the two releases produce significantly different network investment results. On a per wirecenter level, changes range anywhere between -6,000% and +7,000%!

The two analyses in this section give rise to a very important question: Given all the changes in demographic inputs, in national default values, the addition and deletion of variables, the largely different investment estimates, why is it that the Model produces TELRIC estimates that vary only -4.44% for "total loop" and +4.89% for "total cost of switched network elements"? (Percentage changes are for GTE/Contel Texas and are on a per month, per line basis.)

VII. SUMMARY

In the course of the last ten months, we have seen four different versions of the Hatfield Model. First, in May of 1996, there was Hatfield Version 1. In September of the same year, there was Hatfield Version 2.2, Release 2. In February of this year, a Hatfield Model Release 3.0 was filed. Finally, three weeks after, there was Hatfield Model Release 3.1.

We have extensively analyzed, evaluated and criticized all the releases and versions, emphasizing its fundamental flaws and inappropriateness of being a tool to estimate TELRIC of any ILEC.

The structure of the model, however, remained by and large unchanged. The developers of the model choose to ignore the serious modeling mistakes that reside very deep in the structure of the model. Hence, all of our criticisms all thoroughly described in the NERA paper, entitled "Economic Evaluation of the Hatfield Model" by Gregory Ducan and Timothy Tardiff still apply to their fullest extend.

This is not to say no changes were made between releases. In contrary, many changes were made, however, they focused mainly on input variables, their national default values and on demographic inputs. Most of them were very drastic changes, such as the use of a new data base for the use of estimating lines per CBG and the method with which the model estimates

the required distribution cable length per CBG. In the case of GTE, entire companies were added to their territory, namely Contel, to reflect a recent merger.

These changes, however, did have only a very minor impact on the model's TELRIC estimates, confirming our firm belief that the model is highly result-oriented and can therefore not be relied on.

The question, then, remains: How can the Hatfield Model's input be changed so dramatically but then miraculously turn out only minor changes in output? Or maybe we should call it the "Copperfield Model."

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Consulting Economists

State	Wirecenter	Feeder and Distribution Sheath Miles				
		Actual	Per Hatfield Release 2.2	Per Hatfield Release 3.0	Per Hatfield Release3.1	Percentage of Actual (HM 3.1)
(1)	(2)	(3)	(4)	(5)	(6)	(7) (6)/(3)
California	Arrowhead	262.40	40.00	119.81	141.19	0.54
California	Banning	510.80	202.20	318.43	387.96	0.76
California	Carpinteria	159.90	59.40	179.18	162.69	1.02
California	Pinyon	110.50	42.00			

Note:

Includes four (4) misallocated CBGs for Banning.